RIVERS AND FLOODS

[River and Flood Division, MONTROSE W. HAYES in charge]

By W. J. MOXOM

Torrential rainfall in central and northern Texas on September 15–17 and again on September 26–27, 1936, gave unusually high floods in the Colorado and Brazos Rivers and tributaries and moderately high floods in the Trinity, Guadalupe, and Nueces Rivers. Numerous cities and towns in both the Colorado and Brazos drainage basins suffered severely from these floods. In San Angelo, Tex., on the Conchas River, a tributary of the Colorado, approximately 300 homes were swept away, a large portion of the business district and 500 houses were flooded. In the entire flooded area the loss of life was comparatively small, only four persons were reported drowned, but the property losses were very great. Close estimates of property losses are not available, but it is believed they will exceed $5,000,000. The lower reaches of these rivers continued above flood stage at the close of the month.

The Saluda and Santee Rivers in South Carolina were in moderate flood, but losses on the main streams were negligible. Heavy rains on September 30 in northwestern South Carolina caused considerable local flooding in numerous small streams. Roads were damaged and a number of small bridges were destroyed.

Elsewhere flood stages were slightly exceeded at several river stations in widely separated areas, as shown by the table of flood stages below, with little or no losses reported.

Table of flood stages during September 1936

[All dates in September unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	Feet			*Feet*	
Saluda: Pelzer, S. C.	6	30	(1)	13.5	30
Santee:					
Rimini, S. C.	12	6	7	12.3	6
		11	11	12.0	11
		17	20	12.5	19
Ferguson, S. C.	12	20	20	12.0	20
Savannah: Ellenton, S. C.	14	1	2	15.2	1

[1] Continued into October.

Table of flood stages during September 1936—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM					
Missouri Basin					
	Feet			*Feet*	
Big Sioux: Akron, Iowa	12	16	16	13.0	16
Solomon: Beloit, Kans.	18	28	28	18.7	28
Arkansas Basin					
North Canadian:					
Woodward, Okla.	5	5	5	5.0	5
		13	14	6.0	13
Canton, Okla.	6	14	14	6.0	14
Yukon, Okla.	8	15	19	9.8	18
Red Basin					
Sulphur: Ringo Crossing, Tex.	20	28	Oct. 1	22.0	28
WEST GULF OF MEXICO DRAINAGE					
Elm Fork: Carrollton, Tex.	6	28	30	9.4	28, 29
Trinity:					
Dallas, Tex.	28	27	(1)	35.2	28
Trinidad, Tex.	28	29	(1)	34.0	30
Brazos:					
Rainbow, Tex.	20	27	29	22.0	27
Waco, Tex.	27	27	30	40.9	27
Valley Junction, Tex.	44	30	Oct. 1	47.6	Oct. 1
Colorado:					
Marble Falls, Tex.	21	16	23	[2] 30.0	22
		27	(1)	[2] 28.0	27
Mud, Tex.	25	16	17	30.5	17
		23	23	28.6	23
		27	28	44.5	27
Austin, Tex.	21	16	18	25.0	17
		22	23	25.1	23
		27	28	32.9	28
Smithville, Tex.	25	24	25	26.2	24
		29	30	29.6	29
Columbus, Tex.	24	18	27	34.5	26
		29	(1)	34.9	30
Wharton, Tex.	26	19	(1)	36.6	28
Guadalupe:					
Gonzales, Tex.	20	17	19	28.5	18
		29	(1)	29.9	30
Victoria, Tex.	21	20	23	25.1	22
Nueces: Cotulla, Tex.	15	16	24	19.2	17
Rio Grande:					
Del Rio, Tex.	15	28	28	15.5	28
Eagle Pass, Tex.	16	28	28	16.2	28
		2	4	19.4	3
Brownsville, Tex.	18	16	19	19.5	17, 18
		21	23	19.3	22
		29			

[2] Gage destroyed, readings estimated.

WEATHER ON THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, I. R. TANNEHILL in charge]

NORTH ATLANTIC OCEAN, SEPTEMBER 1936

By H. C. HUNTER

Atmospheric pressure.—The average pressure for September was near normal over practically all the western half of the North Atlantic; but was slightly to considerably above normal over the easternmost portion. The departure at Lerwick, Shetland Islands, averaged +0.18 inch, in spite of a marked deficiency there and elsewhere over most northeastern districts from the 3d to the 10th. There was a slight deficiency of the monthly pressure around southern Greenland and a marked deficiency around the Azores; in the latter area the pressure during the second half was almost constantly below normal.

The extremes of pressure found in the regular mail reports are 30.58 and 28.49 inches, which occurred only about 42 hours and approximately 700 miles apart. The higher mark was noted on the American passenger liner *Washington*, at 8 a. m., the 16th, at latitude 41°30′ N., longitude 62°24′ W. The lower mark, at 12:30 a. m., the 18th, was recorded about 50 miles east of Cape Hatteras by the American steamship *Limon*, then very close to the center of the northward-moving hurricane of that date. A radio report indicates a pressure of 28.32 inches on the Swedish tankship *Nike*, as mentioned in the accompanying article on tropical disturbances.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, September 1936*

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland	29.71	−0.05	30.18	27	28.94	30
Reykjavik, Iceland	29.84	+.12	30.39	25	29.32	10
Lerwick, Shetland Islands	30.02	+.18	30.56	16	29.24	7
Valencia, Ireland	30.03	+.04	30.42	15	29.53	3
Lisbon, Portugal	30.13	+.11	30.30	17, 22	29.86	19
Madeira	30.07	+.05	30.27	22	29.89	20
Horta, Azores	30.02	−.15	30.36	4	29.52	20
Belle Isle, Newfoundland	29.90	+.01	30.32	5	29.24	29
Halifax, Nova Scotia	30.07	+.02	30.46	15	29.50	28
Nantucket	30.09	+.01	30.47	14	29.27	19
Hatteras	30.04	−.02	30.28	15	28.89	18
Bermuda	30.09	+.01	30.20	18, 27	29.90	2
Turks Island	29.95	−.03	30.03	24	29.87	16
Key West	29.95	+.01	30.05	24	29.86	16
New Orleans	29.98	.00	30.10	8	29.83	29

NOTE.—All data based on a. m. observations only, with departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

Cyclones and gales.—Elsewhere appears an account of the storms of tropical origin during September. Practically all the noteworthy storm activity before the 26th over the northern part of the North Atlantic was at least closely connected with storms of tropical origin. The hurricane which passed east of Bermuda on the 2d was approximately midway between Cape Race, Newfoundland, and Horta by late evening of the 4th. This storm and a storm from the vicinity of New England apparently merged and the resulting LOW showed considerable strength near the British Isles on the 6th and 7th, the center being close to northern Scotland on the latter date, when a wind of force 11 was noted in the southwestern part of the North Sea. The center then proceeded over the southern part of the Baltic Sea.

The hurricane of the 8th to 26th caused winds of force 11 or 12 on the 19th to the southeastward of Long Island and the Massachusetts coast, and on the 20th and 21st near and slightly to the eastward of the Grand Banks. Its force was apparently less to eastward of the fortieth meridian on the succeeding days, but gales were noted near the Azores and for moderate distances to northward about the 22d to 25th. Comparatively few lives were lost as a result of this storm; it is believed that all hands were saved when the fishing steamer *Long Island* sank in lower Delaware Bay on the 18th. Chart IX indicates the situation on the 16th, while both this hurricane and the later one appear upon chart X, for the 23d.

The hurricane of the 19th to 24th did not closely approach the coast of the United States till it was north of the fortieth parallel. This storm, merging with a storm from a westerly area near Novia Scotia about the 25th, seems to have been connected with the strong to whole gales noted southeast of Newfoundland on the 26th and 27th. On the latter date another disturbance was over the Lake region, and this became a storm of great strength near Newfoundland on the 28th and 29th. The American steamship *Memphis City*, when about 300 miles east-northeast of Belle Isle on the 29th and 30th, noted winds at one time of force 11, and estimated the height of the seas as 80 feet. The ship was forced to run before the storm for 30 hours. Press reports indicate that four schooners were wrecked on the Labrador coast and one or two others on the Newfoundland shores.

Local squall in tropics.—The British motor vessel *Husvik*, which reached Port au Price Harbor, Haiti, late on the 4th, there encountered, about 6:20 to 8 p.m., a severe squall or storm, with the wind attaining force 9 for a time and always from a northeasterly direction. The barometer was throughout at about normal height (30.03 inches the lowest), so the phenomenon probably was confined to a very small area.

Fog.—There was considerably less fog over the greater part of the North Atlantic, north of the fortieth parallel of latitude, than is usually noted during September. Compared with August the decrease in fogginess was marked. Between the fortieth and twenty-fifth meridians September brought scarcely any fog; but, on the other hand, just west of the Bay of Biscay and the English Channel, the square between 45° and 50° N., 5° and 10° W., had 7 days with fog, which is more than usually occurs in that area.

Over the Grand Banks and waters around Newfoundland, and thence southwestward and westward to the east coast of New England there was mostly about as much fog as usual in September. The square from 40° to 45° N., 65° to 70° W., reported 12 days with fog. While there was less fog than this from southern New England to the vicinity of the Chesapeake capes, yet it was much more than normally occurs there at the time of year. To southward of Hatteras no fog at all was reported.

Two collisions due to fog occurred near the American shores. Just outside Boston harbor, on the 9th, two passenger boats came together and the smaller soon sank, but apparently without loss of life. During the foggy period from the 21st to 25th, two steamships collided in East River, near Hell Gate; one of them sank but was duly raised; also a tanker grounded in Boston harbor, but was shortly refloated.